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**U.S. National Recovery  
Administration**

Title:

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industry**

Place:

**[Washington, D.C.]**

Date:

**1933**

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THE GRAY IRON FOUNDRY INDUSTRY

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## THE GRAY IRON FOUNDRY INDUSTRY

### SUMMARY OF FACTS

#### Chapter I - General

The Gray Iron Foundry Industry Code should have provisions similar to the codes of consuming industries because it is a producers' goods industry, and is in competition with the foundry departments of the industries which buy part or all of their gray iron castings.

As a producers' goods industry the Gray Iron Foundry Industry has suffered severely during the depression. In July, 1933, the average production per foundry was less than half of the 1929 peak.

#### Chapter II - Hours and Employment

The average hours per worker in the first quarter of 1933 were 23.5, against 55 in 1926, - on a weekly basis.

The average hours worked per day on June 1, 1933, were 5½.

Over 70% of the employees in 52 Southern foundries worked more than 40 hours per week in July, 1933. The estimated number of employees in July, 1933, was 53,500.

#### Chapter III - Wages

Common labor rates in gray iron foundries were 45.7 cents per hour in October, 1931, and 16½ of all shop

employees in this group.

The average entrance rate for common labor was 31.8 cents per hour in foundries and machine shops on July 1, 1933.

The weighted average minimum wage rate in 92 Southern gray iron foundries was 19.5 cents per hour in the first quarter of 1933. The corresponding figure for 731 Northern foundries was 30.7 cents. The weighted average for 823 foundries in the United States was over 30.1 cents. An unweighted average for the United States would be over 32 cents.

The average entrance rates for common labor in the South were 21.8 cents on July 1, 1933, against 35.4 cents in the North.

The minimum wage rates proposed in the code will increase purchasing power, but not over 5%.

#### Chapter IV - Selling Prices and Raw Material Costs.

The average price per ton of gray iron castings runs around \$70.

Raw materials are chiefly pig iron and scrap. Pig iron prices have risen over 20% from the low of the year and scrap prices have doubled. The costs of production have increased.

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Chapter V - PART A. Determination of Maximum Hours

The proposed maximum work period per week of 40 hours would have affected 70% of the employees in Southern mills in July.

The number reemployed at 40 hours in July, 1933 would have been 5,350.

PART B. Determination of a Minimum Wage

The minimum wage rates in competitive industries in the South are 25 cents per hour for common labor, with 27 cents at Birmingham. Under this code only 25 cents would be paid at Birmingham, giving this industry a competitive advantage.

The recommended minimum wages in the North are 37 cents per hour where the population is under 2,500.

38    \*    \*    \*    \*    \*    \*    \*    \* 250,000.

39    \*    \*    \*    \*    \*    \*    \*    \* 500,000.

40    \*    \*    \*    \*    \*    \*    \*    \* over 500,000.

PART C. Recommendation on Selling Below Cost

The model code provisions on Selling-Below-Cost should be substituted for Article VII, Section 1 (1).

## THE GRAY IRON FOUNDRY INDUSTRY

### CHAPTER I

#### GENERAL POSITION AND CHARACTERISTICS OF THE INDUSTRY

The gray iron foundry industry includes the business of producing and selling, or just selling in the open market ferrous or ferrous base castings other than steel or malleable iron castings, whether cast in sand or other types of mold. Such castings are commonly known as Gray Iron Jobbing Castings, and are sold in competition with similar gray iron jobbing castings, either with or without any subsequent processing thereon performed by the producer. A manufacturer in another industry who produces and/or sells gray iron castings for use in his products would operate under the code of his industry.

Gray iron jobbing foundries may manufacture new parts for a manufacturer in another industry, or repair parts for a consumer of the product, or both. Therefore, a gray iron jobbing foundry may manufacture parts of products which come under a number of different codes. It follows that the labor provisions of these various codes will vitally affect the gray iron jobbing foundries, for if the minimum wage in one of these "product"

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industries which has been buying its castings is lower than that in the gray iron foundry which has been selling those castings, then the industry producing the finished product may find that it is cheaper to manufacture its own castings. Conversely, the manufacturer of a product who is accustomed to manufacture his own castings might be forced to buy his castings from gray iron jobbing foundries if the minimum wages in his industry were higher than those in the jobbing foundries. Therefore, the labor provisions in the gray iron jobbing foundries should be approximately the same as the labor provisions in the industries which buy gray iron castings.

The industries which consume gray iron castings are very numerous. A survey covering 610 gray iron foundries of the 4,009 on Penton's Foundry List in 1927 was made by the Bureau of Foreign and Domestic Commerce of the Department of Commerce between July, 1925 and June, 1927, which showed the number of foundries that manufactured specified types of gray iron castings. A summary of these types is given in the following table, in the order of the number of foundries which produced each particular type of gray iron casting, whether for own use, for sale, or both.

FOUNDRIES MANUFACTURING SPECIFIC TYPES OF  
GRAY-IRON CASTINGS

<u>LIGHT</u> (Less than 500 Lbs.)	<u>HEAVY</u> (More than 500 Lbs.)
Miscellaneous Light	Machine tools
Light Machinery	Engines (gas, steam, oil)
Street equipment (lamp- posts, manhole covers, curbs, sewer openings, markers, etc.)	Material-handling machinery
Agricultural	Miscellaneous heavy
Boiler	Sand-making machinery
Automotive	Heat treating equipment; (furnaces, pots, etc.)
Stove plate	Mining Machinery
Ornamental	Paper mill machinery
Builders' hardware	Car wheels
Plumbing & Steamfitting	Electrical machinery
Electrical appliances	Heavy stamping presses
Warm air furnaces	Printing machinery
Pump: steam & water	Textile machinery
Washing & ironing machines	Sugar mill machinery
Electrical motors	Soil pipe
Hot-water heaters	Plate glass machinery
Meters (gas, electric, water)	
Scales (cash register, adding machine, typewriter, vending machine)	
Furniture (including school, church, auditorium and barber- chair castings)	
Refrigerators	
Pump: gas and oil	
Sanitary	
Toys	
Radiators	

Most of the industries listed in the above table come under codes of industries other than the gray iron foundry industry. This accounts for the fact that there are approximately only 1,600 gray iron jobbing foundries

included under the Gray Iron Foundry Code, out of a total of about 3,500 gray iron foundries now in existence. The 2,000 gray iron foundries which do not come under the Gray Iron Foundry Code are not as a rule in direct competition with jobbing foundries except in manufacturing repair parts. But there is, nevertheless, indirect competition, because many of the industries operating under their own codes will produce their own gray iron castings or buy them from jobbing foundries, whichever is the more economical procedure.

The chief products which compete with gray iron castings are steel castings, malleable iron castings, non-ferrous castings, welded steel products, stampings, forgings and pressed steel products.

The gray iron foundry industry is a producers' goods industry, and is cyclical and unstable, as is shown by the fact that the average tons produced per year per foundry declined over 80% from the April, 1929 peak to the July, 1932 low.

### SPECIAL SURVEY OF 60 SELECTED FOUNDRIES

A special tabulation of 60 representative gray iron foundries was made by the Bureau of the Census for the years 1929 and 1931. These representative foundries were equally divided between the Northern and the Southern districts. A summary is given in the attached table.

Since the sample is very small the aggregate amounts are of little significance. The ratios, however, may be considered as representative, for if the sample is well chosen the ratios would remain approximately the same if the industry were covered in its entirety.

The average wages per wage earner for the 60 foundries was \$1,013 for the year 1931, against \$1,302 in 1929. The average wages in the 30 Northern foundries were nearly 40% larger than the average in the 30 Southern foundries. (The average wage in independent steel foundries in 1929 was \$1,674.)

Wages were 40.4% of the value of products in 1931, against 38.2% in 1929 for the 60 foundries. The ratio of wages to the value of products was considerably greater in the <sup>30</sup> Northern foundries as compared with the 30 Southern foundries.

THE GRAY IRON FOUNDRY INDUSTRY

SPECIAL SURVEY OF 60 REPRESENTATIVE FOUNDRIES  
BY THE BUREAU OF THE CENSUS

	1929			1931		
	No.	U.S.	No.	No.	U.S.	
Number of Establishments	30	30	60	30	30	60
Wage Earners	1,679	2,752	4,431	1,241	1,815	3,056
Wages (\$1,000)	\$1,725	4,044	5,769	1,017	2,078	3,095
Cost of (\$1,000)						
Materials	\$2,103	2,510	4,613	1,090	1,396	2,485
Value of Products (\$1,000)	\$5,946	9,158	15,105	3,096	4,556	7,653
Value Added by Manufacture (\$1,000)	83,844	6,648	10,492	2,006	3,161	5,167
Average Wages per Worker	\$1,027	1,469	1,302	820	1,145	1,013
Wages/Value of Products	29.0%	44.2%	38.2%	32.9%	45.6%	40.4%
Wages/Value Added	44.9%	60.8%	55.0%	50.7%	65.7%	59.9%
Wages/Cost of Materials	82.0%	161.1%	125.1%	93.4%	148.9%	124.6%
Tons Produced	104,337	87,152	191,489	60,497	53,890	114,387
Tons per Wage Earner	62.1	32.7	43.2	48.7	29.7	37.4

FOR: 1a  
11/18/33

Exports - page 107 In. Commerce & Nav. of U. S. 1933 - 31-28

1933

1931 - page 122

1928 - pg 120

Iron Castings -	421,840	688,957	\$ 1,517,737
Canada	283,436	492,796	905,507
Mexico	42,862	19,875	42,931

ADDITIONAL INFORMATION AS TO TOTALS

3 mos. 1935 - \$ 200,867

ITEM	1935		1931		1928
	AMT	PER	AMT	PER	
1. IRON					
1.1. IRON, 1	110,1	55%	117,0	55%	110,1
1.2. IRON, 2	85,7	45%	80,7	45%	80,7
1.3. IRON, 3	39,7	20%	40,7	20%	40,7
1.4. IRON, 4	29,7	15%	30,7	15%	30,7
1.5. IRON, 5	10,7	5%	10,7	5%	10,7
1.6. IRON, 6	10,7	5%	10,7	5%	10,7
1.7. IRON, 7	10,7	5%	10,7	5%	10,7
1.8. IRON, 8	10,7	5%	10,7	5%	10,7
1.9. IRON, 9	10,7	5%	10,7	5%	10,7
1.10. IRON, 10	10,7	5%	10,7	5%	10,7
1.11. IRON, 11	10,7	5%	10,7	5%	10,7
1.12. IRON, 12	10,7	5%	10,7	5%	10,7
1.13. IRON, 13	10,7	5%	10,7	5%	10,7
1.14. IRON, 14	10,7	5%	10,7	5%	10,7
1.15. IRON, 15	10,7	5%	10,7	5%	10,7
1.16. IRON, 16	10,7	5%	10,7	5%	10,7
1.17. IRON, 17	10,7	5%	10,7	5%	10,7
1.18. IRON, 18	10,7	5%	10,7	5%	10,7
1.19. IRON, 19	10,7	5%	10,7	5%	10,7
1.20. IRON, 20	10,7	5%	10,7	5%	10,7
1.21. IRON, 21	10,7	5%	10,7	5%	10,7
1.22. IRON, 22	10,7	5%	10,7	5%	10,7
1.23. IRON, 23	10,7	5%	10,7	5%	10,7
1.24. IRON, 24	10,7	5%	10,7	5%	10,7
1.25. IRON, 25	10,7	5%	10,7	5%	10,7
1.26. IRON, 26	10,7	5%	10,7	5%	10,7
1.27. IRON, 27	10,7	5%	10,7	5%	10,7
1.28. IRON, 28	10,7	5%	10,7	5%	10,7
1.29. IRON, 29	10,7	5%	10,7	5%	10,7
1.30. IRON, 30	10,7	5%	10,7	5%	10,7
1.31. IRON, 31	10,7	5%	10,7	5%	10,7
1.32. IRON, 32	10,7	5%	10,7	5%	10,7
1.33. IRON, 33	10,7	5%	10,7	5%	10,7
1.34. IRON, 34	10,7	5%	10,7	5%	10,7
1.35. IRON, 35	10,7	5%	10,7	5%	10,7
1.36. IRON, 36	10,7	5%	10,7	5%	10,7
1.37. IRON, 37	10,7	5%	10,7	5%	10,7
1.38. IRON, 38	10,7	5%	10,7	5%	10,7
1.39. IRON, 39	10,7	5%	10,7	5%	10,7
1.40. IRON, 40	10,7	5%	10,7	5%	10,7
1.41. IRON, 41	10,7	5%	10,7	5%	10,7
1.42. IRON, 42	10,7	5%	10,7	5%	10,7
1.43. IRON, 43	10,7	5%	10,7	5%	10,7
1.44. IRON, 44	10,7	5%	10,7	5%	10,7
1.45. IRON, 45	10,7	5%	10,7	5%	10,7
1.46. IRON, 46	10,7	5%	10,7	5%	10,7
1.47. IRON, 47	10,7	5%	10,7	5%	10,7
1.48. IRON, 48	10,7	5%	10,7	5%	10,7
1.49. IRON, 49	10,7	5%	10,7	5%	10,7
1.50. IRON, 50	10,7	5%	10,7	5%	10,7
1.51. IRON, 51	10,7	5%	10,7	5%	10,7
1.52. IRON, 52	10,7	5%	10,7	5%	10,7
1.53. IRON, 53	10,7	5%	10,7	5%	10,7
1.54. IRON, 54	10,7	5%	10,7	5%	10,7
1.55. IRON, 55	10,7	5%	10,7	5%	10,7
1.56. IRON, 56	10,7	5%	10,7	5%	10,7
1.57. IRON, 57	10,7	5%	10,7	5%	10,7
1.58. IRON, 58	10,7	5%	10,7	5%	10,7
1.59. IRON, 59	10,7	5%	10,7	5%	10,7
1.60. IRON, 60	10,7	5%	10,7	5%	10,7
1.61. IRON, 61	10,7	5%	10,7	5%	10,7
1.62. IRON, 62	10,7	5%	10,7	5%	10,7
1.63. IRON, 63	10,7	5%	10,7	5%	10,7
1.64. IRON, 64	10,7	5%	10,7	5%	10,7
1.65. IRON, 65	10,7	5%	10,7	5%	10,7
1.66. IRON, 66	10,7	5%	10,7	5%	10,7
1.67. IRON, 67	10,7	5%	10,7	5%	10,7
1.68. IRON, 68	10,7	5%	10,7	5%	10,7
1.69. IRON, 69	10,7	5%	10,7	5%	10,7
1.70. IRON, 70	10,7	5%	10,7	5%	10,7
1.71. IRON, 71	10,7	5%	10,7	5%	10,7
1.72. IRON, 72	10,7	5%	10,7	5%	10,7
1.73. IRON, 73	10,7	5%	10,7	5%	10,7
1.74. IRON, 74	10,7	5%	10,7	5%	10,7
1.75. IRON, 75	10,7	5%	10,7	5%	10,7
1.76. IRON, 76	10,7	5%	10,7	5%	10,7
1.77. IRON, 77	10,7	5%	10,7	5%	10,7
1.78. IRON, 78	10,7	5%	10,7	5%	10,7
1.79. IRON, 79	10,7	5%	10,7	5%	10,7
1.80. IRON, 80	10,7	5%	10,7	5%	10,7
1.81. IRON, 81	10,7	5%	10,7	5%	10,7
1.82. IRON, 82	10,7	5%	10,7	5%	10,7
1.83. IRON, 83	10,7	5%	10,7	5%	10,7
1.84. IRON, 84	10,7	5%	10,7	5%	10,7
1.85. IRON, 85	10,7	5%	10,7	5%	10,7
1.86. IRON, 86	10,7	5%	10,7	5%	10,7
1.87. IRON, 87	10,7	5%	10,7	5%	10,7
1.88. IRON, 88	10,7	5%	10,7	5%	10,7
1.89. IRON, 89	10,7	5%	10,7	5%	10,7
1.90. IRON, 90	10,7	5%	10,7	5%	10,7
1.91. IRON, 91	10,7	5%	10,7	5%	10,7
1.92. IRON, 92	10,7	5%	10,7	5%	10,7
1.93. IRON, 93	10,7	5%	10,7	5%	10,7
1.94. IRON, 94	10,7	5%	10,7	5%	10,7
1.95. IRON, 95	10,7	5%	10,7	5%	10,7
1.96. IRON, 96	10,7	5%	10,7	5%	10,7
1.97. IRON, 97	10,7	5%	10,7	5%	10,7
1.98. IRON, 98	10,7	5%	10,7	5%	10,7
1.99. IRON, 99	10,7	5%	10,7	5%	10,7
1.100. IRON, 100	10,7	5%	10,7	5%	10,7
1.101. IRON, 101	10,7	5%	10,7	5%	10,7
1.102. IRON, 102	10,7	5%	10,7	5%	10,7
1.103. IRON, 103	10,7	5%	10,7	5%	10,7
1.104. IRON, 104	10,7	5%	10,7	5%	10,7
1.105. IRON, 105	10,7	5%	10,7	5%	10,7
1.106. IRON, 106	10,7	5%	10,7	5%	10,7
1.107. IRON, 107	10,7	5%	10,7	5%	10,7
1.108. IRON, 108	10,7	5%	10,7	5%	10,7
1.109. IRON, 109	10,7	5%	10,7	5%	10,7
1.110. IRON, 110	10,7	5%	10,7	5%	10,7
1.111. IRON, 111	10,7	5%	10,7	5%	10,7
1.112. IRON, 112	10,7	5%	10,7	5%	10,7
1.113. IRON, 113	10,7	5%	10,7	5%	10,7
1.114. IRON, 114	10,7	5%	10,7	5%	10,7
1.115. IRON, 115	10,7	5%	10,7	5%	10,7
1.116. IRON, 116	10,7	5%	10,7	5%	10,7
1.117. IRON, 117	10,7	5%	10,7	5%	10,7
1.118. IRON, 118	10,7	5%	10,7	5%	10,7
1.119. IRON, 119	10,7	5%	10,7	5%	10,7
1.120. IRON, 120	10,7	5%	10,7	5%	10,7
1.121. IRON, 121	10,7	5%	10,7	5%	10,7
1.122. IRON, 122	10,7	5%	10,7	5%	10,7
1.123. IRON, 123	10,7	5%	10,7	5%	10,7
1.124. IRON, 124	10,7	5%	10,7	5%	10,7
1.125. IRON, 125	10,7	5%	10,7	5%	10,7
1.126. IRON, 126	10,7	5%	10,7	5%	10,7
1.127. IRON, 127	10,7	5%	10,7	5%	10,7
1.128. IRON, 128	10,7	5%	10,7	5%	10,7
1.129. IRON, 129	10,7	5%	10,7	5%	10,7
1.130. IRON, 130	10,7	5%	10,7	5%	10,7
1.131. IRON, 131	10,7	5%	10,7	5%	10,7
1.132. IRON, 132	10,7	5%	10,7	5%	10,7
1.133. IRON, 133	10,7	5%	10,7	5%	10,7
1.134. IRON, 134	10,7	5%	10,7	5%	10,7
1.135. IRON, 135	10,7	5%	10,7	5%	10,7
1.136. IRON, 136	10,7	5%	10,7	5%	10,7
1.137. IRON, 137	10,7	5%	10,7	5%	10,7
1.138. IRON, 138	10,7	5%	10,7	5%	10,7
1.139. IRON, 139	10,7	5%	10,7	5%	10,7
1.140. IRON, 140	10,7	5%	10,7	5%	10,7
1.141. IRON, 141	10,7	5%	10,7	5%	10,7
1.142. IRON, 142	10,7	5%	10,7	5%	10,7
1.143. IRON, 143	10,7	5%	10,7	5%	10,7
1.144. IRON, 144	10,7	5%	10,7	5%	10,7
1.145. IRON, 145	10,7	5%	10,7	5%	10,7
1.146. IRON, 146	10,7	5%	10,7	5%	10,7
1.147. IRON, 147	10,7	5%	10,7	5%	10,7
1.148. IRON, 148	10,7	5%	10,7	5%	10,7
1.149. IRON, 149	10,7	5%	10,7	5%	10,7
1.150. IRON, 150	10,7	5%	10,7	5%	10,7
1.151. IRON, 151	10,7	5%	10,7	5%	10,7
1.152. IRON, 152	10,7	5%	10,7	5%	10,7
1.153. IRON, 153	10,7	5%	10,7	5%	10,7
1.154. IRON, 154	10,7	5%	10,7	5%	10,7
1.155. IRON, 155	10,7	5%	10,7	5%	10,7
1.156. IRON, 156	10,7	5%	10,7	5%	10,7
1.157. IRON, 157	10,7	5%	10,7	5%	10,7
1.158. IRON, 158	10,7	5%	10,7	5%	10,7
1.159. IRON, 159	10,7	5%	10,7	5%	10,7
1.160. IRON, 160	10,7	5%	10,7	5%	10,7
1.161. IRON, 161	10,7	5%	10,7	5%	10,7
1.162. IRON, 162	10,7	5%	10,7	5%	10,7
1.163. IRON, 163	10,7	5%	10,7	5%	10,7
1.164. IRON, 164	10,7	5%	10,7	5%	10,7
1.165. IRON, 165	10,7	5%	10,7	5%	10,7
1.166. IRON, 166	10,7	5%	10,7	5%	10,7
1.167. IRON, 167	10,7	5%	10,7	5%	10,7
1.168. IRON, 168	10,7	5%	10,7	5%	10,7
1.169. IRON, 169	10,7	5%	10,7	5%	10,7
1.170. IRON, 170	10,7	5%	10,7	5%	10,

Wages in the foundries constituted 59.9% of the value added by manufacture in 1931, against 55.0% in 1929. But the ratio of wages to the value added by manufacture was considerably larger in the 30 Northern foundries as compared with the 30 Southern foundries.

Wages in the 60 foundries were 24.6% larger than the cost of materials in 1931, and 25.1% larger in 1929. For the 30 Northern foundries wages were 48.9% larger than the cost of materials in 1931, and 61.1% larger in 1929. In the 30 Southern foundries wages were 6.6% smaller than the cost of materials in 1931, and 18% smaller in 1929.

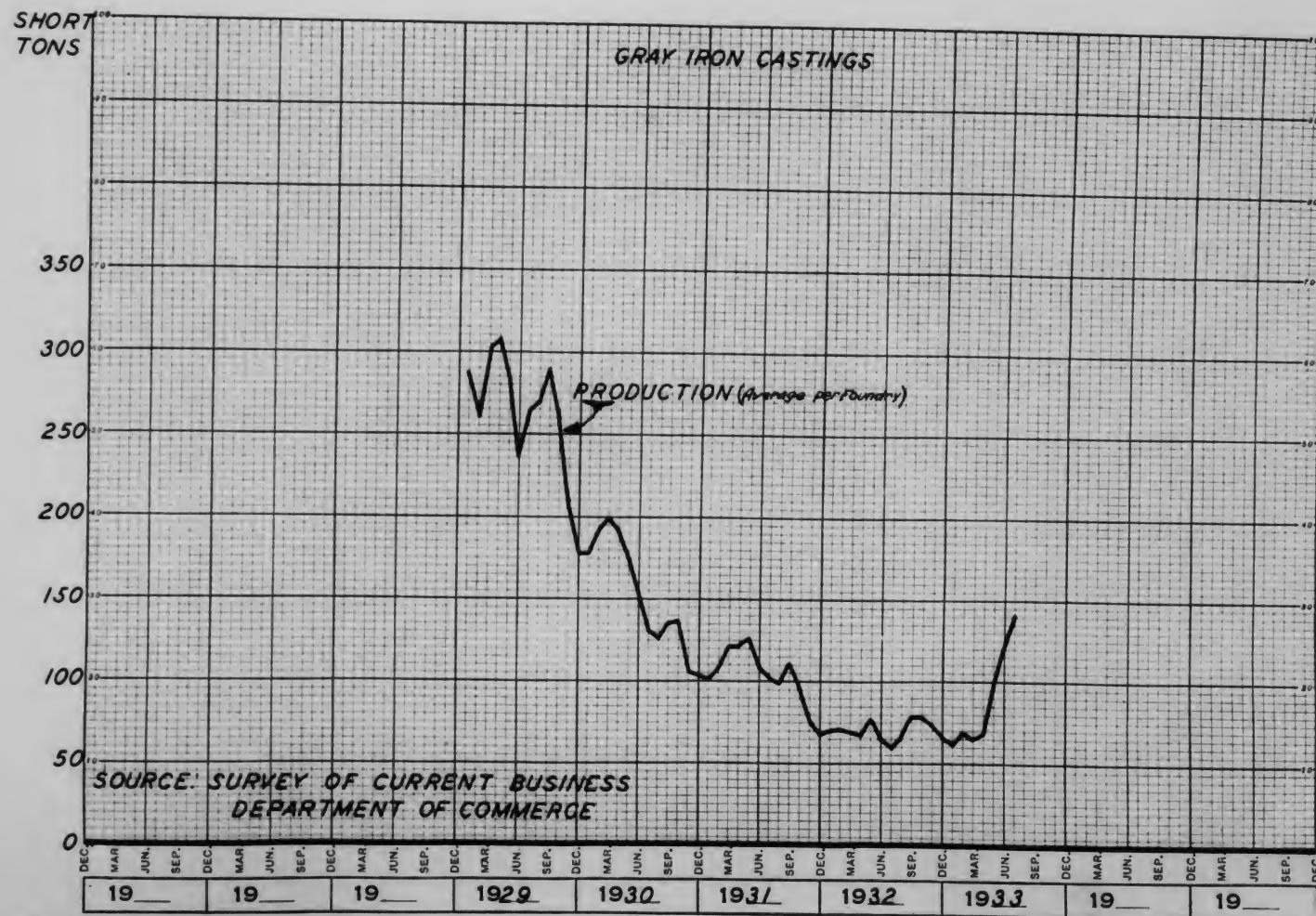
#### PRODUCTION DURING THE DEPRESSION

The Department of Commerce, Bureau of the Census, has published monthly statistics covering new orders, unfilled orders, production, receipts of materials, and stocks of materials from January, 1929 through July, 1933.] Since then the compilations have been discontinued by the Gray Iron Institute, and therefore are no longer reported to the Bureau of the Census.

The series representing average production per foundry has been charted, and is presented herewith as



## GRAY IRON FOUNDRY INDUSTRY



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a pattern of the changes in employment requirements in operating foundries during the depression.

The decline in the average production per foundry between the April, 1929 peak and the July, 1932 low was over 80%. At the July, 1933 level of production the decline from the April, 1929 peak was over 50%. Therefore, barring technological improvements the employment requirements in July, 1933 were less than half of those of April, 1929.

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## CHAPTER II

### HOURS AND EMPLOYMENT

The Industry engaged an outside agency, the Fenton Publishing Company to send out several thousand questionnaires to gray iron foundries, and of these over 900 replies were received. This questionnaire furnished statistics on average hours per week of gray iron foundry operation. The replies from 866 plants showed an average of 55 hours during 1926, but only 23.5 hours in 869 plants during the first quarter of 1933.

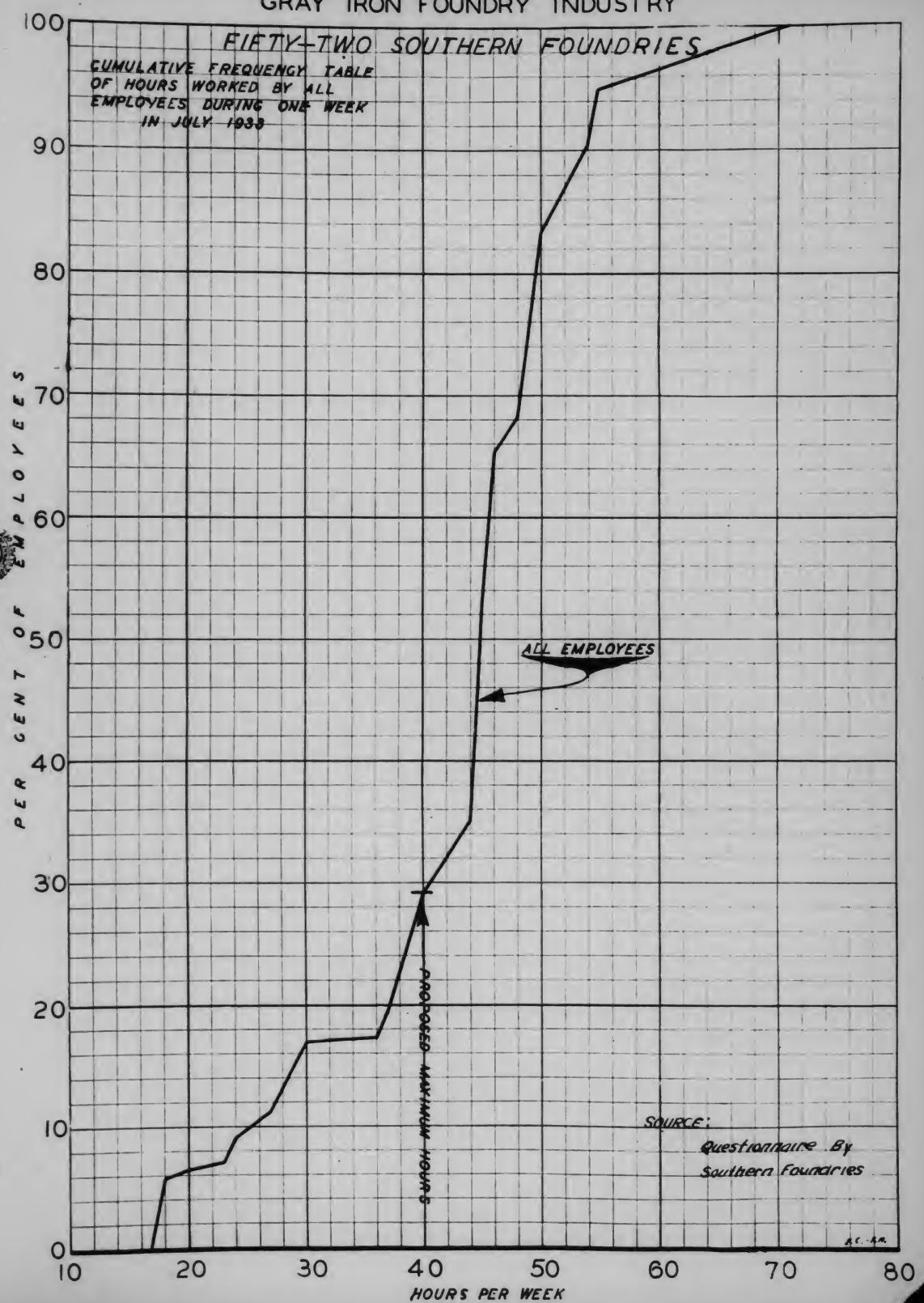
This questionnaire also showed that in 915 plants the average hours per employee per working day on June 1, 1933 was 8.75 hours.

A special survey by 52 southern foundries showed that in 1928 and 1929 the majority of employees were working over 50 hours per week. In 1930 the largest group of employees worked 45 hours per week, the next largest groups 54 and 55 hours respectively. By 1931 more employees worked 36 hours than any other period, but next in order were the 45 hour, then the 50 hour, and then the 40 hour group. In 1932 the largest number of employees in any group fell in the 30 hour classification, the next largest in the 36 hour, the 34 hour and

GRAY IRON FOUNDRY INDUSTRY

CODEX BOOK COMPANY, INC. NORWOOD, MASSACHUSETTS

NO. 322. 5 DIVISIONS PER INCH BOTH WAYS. 35 BY 50 DIVISIONS.



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9 hour respectively. In July 1933 the weekly work periods in the order of their importance were 45, 50, 46, 40, and 54 hours respectively. (See table).

A cumulative frequency table was made for these 52 Southern foundries, and is presented herewith in chart form. It shows that over 70 per cent of the employees in these foundries would have had their hours reduced in July, 1933, if the proposed maximum of 40 hours had been put into effect at that time.

## GRAY IRON FOUNDRY INDUSTRY

TABLE

NUMBER OF EMPLOYEES WORKING SPECIFIED AVERAGE HOURS  
PER WEEK, 1926, 1929, 1930, 1931, 1932, JULY  
1933

52 Southern Foundries

Average Number of Hours per Week	Number of Employees					July 1933		
	1926	1929	1930	1931	1932	Employees	Per Cent of Cumu- lative	
<b>TOTAL</b>								
9.....	--	--	--	--	--	113	--	--
12.....	--	--	--	--	--	10	--	--
15.....	--	--	--	68	3	78	5.4	5.4
20.....	--	--	--	54	31	11	.8	6.2
21.....	--	--	--	--	--	--	--	--
22.....	--	--	--	--	47	--	--	--
23.....	--	--	--	--	42	12	.8	7.0
24.....	--	--	--	11	12	30	2.1	9.1
25.....	--	--	--	--	55	--	--	--
27.....	--	--	16	116	80	26	2.0	11.1
29.....	--	--	44	45	--	--	--	--
30.....	--	--	44	34	166	65	5.9	17.0
31.....	--	43	--	--	--	--	--	--
32.....	--	--	--	23	55	--	--	--
33.....	--	--	79	38	--	--	--	--
34.....	--	--	64	30	117	--	--	--
35.....	--	50	125	265	143	2	.1	17.1
37.....	99	--	--	--	--	34	2.4	19.5
38.....	--	--	45	4	--	--	--	--
40.....	62	26	76	145	53	136	9.6	29.1
43.....	--	--	187	--	--	--	--	--
44.....	25	25	57	141	81	85	5.9	35.0
45.....	--	292	376	210	57	262	18.3	53.3
46.....	--	--	--	--	--	171	11.9	65.2
48.....	161	180	190	18	17	43	3.0	68.2
49.....	48	--	--	--	--	--	--	--
49½.....	9	9	9	9	7	--	--	--
50.....	541	406	63	157	--	222	15.5	83.7
51.....	5	--	--	--	--	--	--	--

Average Number of Hours per Week	Number of Employees					July 1933		
						Per Cent		
	1928	1929	1930	1931	1932	Employees	Total	Cumulative
52.....	10	--	--	--	4	--	--	--
53.....	125	125	--	3	--	--	--	--
54.....	427	449	221	137	57	98	6.8	90.5
55.....	257	271	210	34	30	64	4.5	95.0
55½.....	349	341	--	--	--	--	--	--
57.....	--	5	4	4	--	--	--	--
58.....	12	9	10	9	8	--	--	--
60.....	25	5	--	--	--	19	1.3	96.3
71.....	--	--	--	--	--	50	3.5	99.8
						Total 1,410	100.0	100.0

The man-hours worked in July 1933 totaled 62,158. The weighted average hours worked was 54.1 hours.

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### Employment

No reliable figures are available which would show the number employed in the Gray Iron Foundry Industry. But from the various questionnaires, and the reports on production of the Department of Commerce, it is possible to build up an estimate.

The average weekly hours per employee in the first quarter of 1933 was 23.5 hours, as reported in the questionnaire of the Fenton Publishing Company, and represent returns from 889 foundries.

The number of weeks in a working month was assumed to be 4.3 during the first quarter of 1933.

The average number of employees per foundry was 29 during the first quarter of 1933, according to 907 returns to the Fenton Publishing Company's questionnaire.

From the above information the average man hours per foundry were estimated to be 2,930 per month.

The average production per foundry was reported to be 46.75 short tons per month by 903 foundries in the Fenton Publishing Company's questionnaire.

The ratio of the man hours per foundry to the production per foundry gave a figure of 62.75 man hours required per ton produced during the first quarter of 1933.

Using the above computation of the man hours required

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per ton of production it was then possible to work up to the estimated average man hour requirements in July 1933, and to divide this by the estimated average hours per foundry in order to find the number employed per foundry.

The production per foundry was estimated to be 101 short tons in July, based on an increase of 116 per cent in the production per foundry (computed from reports of the Department of Commerce) between the first quarter and July of 1933.

At 62.75 man hours per ton, this would mean an average of 6,330 man hours per foundry in July 1933.

The average hours in July were assumed to be 44.1 per week, the same as in the 52 Southern foundries, which reported hours in a special questionnaire.

Assuming 4.3 working weeks per month, the average working hours per employee in July would be 189.6

With 6,330 man hours per foundry and 189.6 hours worked per man, the number of employees would be 33.4 per foundry. With 1,602 foundries the estimated number employed in July 1933 would be  $(1,602 \times 33.4) 53,500$ . This compares with an estimate of  $(1,602 \times 29) 46,450$  for the first quarter of 1933.

A summary of the above compilations follows:

(Table on next page)

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AVERAGE PER GRAY IRON FOUNDRY

<u>1933</u>	<u>Hours per Week</u>	<u>Hours per Month</u>	<u>Man Hours</u>	<u>Production</u>	<u>Man Hours per Ton</u>
1st Quarter	23.5	101.1	29	2,930	46.75
July	44.1	189.6	33.4	6,330	101.00
					62.75

## EMPLOYMENT

<u>1933</u>	<u>Per Foundry</u>	<u>Number of Foundries</u>	<u>Estimated Total</u>
1st Quarter	29	1,602	46,450
July	33.4	1,602	53,500

If the weighted average hours of the 52 Southern foundries is representative of the average for the country, a 40 hour week would mean a gain of 10 per cent or more in employment, or an increase of about 5,350.

## CHAPTER III

## WAGES

The reported wage rates for foundry workers do not in any case show the differences in the rates paid in the various subdivisions of the foundry industry. This is true of the average wage rates for foundries as reported by the Bureau of Labor Statistics in its biennial studies, and also of the average wage rates paid in foundries as compiled by the National Industrial Conference Board.

The only available wage data for gray iron foundries, other than that which was collected recently by the industry for code purposes, was published in the Monthly Review of the Bureau of Labor Statistics in December 1931. This material was gathered by the Gray Iron Institute in the form of wage reports and circular letters during October 1931, and covers hourly wage rates by classes of occupations for February and August 1930, and February and October 1931. This data is shown in the attached table.

The figures given in this table show that women cormakers received a lower rate of pay than common laborers. The spread was usually 5 cents or more for the four dates mentioned.

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Comparative Wage Rates in Selected Occupations  
on Specified Dates in Gray Iron Foundries

Occupation	February	August	February	August
	1930	1930	1931 <sup>a</sup>	1931 <sup>b</sup>
	(Cents per hour)	(Cents per hour)	(Cents per hour)	(Cents per hour)
<b>Holders:</b>				
Bench	61.4	79.8	75.3	76.2
Floor	63.0	84.1	61.9	83.3
Loam	78.0	71.1	76.2	66.1
Machine	74.6	70.9	66.6	64.2
<b>Core makers:</b>				
Men	73.7	71.4	70.8	69.2
Women	43.9	42.7	41.9	42.1
<b>Pattern makers:</b>				
Wood	82.9	84.7	76.5	75.2
Metal	72.9	76.7	72.6	69.0
<b>Chippers</b>	53.3	52.6	51.9	51.1
<b>Common laborers</b>	46.4	47.1	47.4	45.7

<sup>a</sup>/ 157 foundries having 10,159 employees in February, 1931.

<sup>b</sup>/ 118 foundries having 5,629 employees in October, 1931.

Source: Monthly Labor Review of Bureau of Labor Statistics, December 1931, page 197 (data from circular letter of the Gray Iron Institute, October 30, 1931).

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Below is a comparison of the average hourly wage rates for common labor as given for gray iron foundries with the average hourly wage rates for common labor in all foundries on the nearest corresponding date.

Average Hourly Wage Rates for Common Labor

Gray Iron Foundries Common Labor <sup>a</sup>	All Foundries		
	Male Laborers <sup>b</sup>	Male Unskilled Labor <sup>b</sup>	Male Skilled Labor <sup>b</sup>
(Cents per hour)	(Cents per hour)	(Cents per hour)	
Feb. 1930	46.4		1st quarter 1930
Aug. 1930	47.1		3rd quarter 1930
Feb. 1931	47.4		1st quarter 1931
Oct. 1931	45.7		4th quarter 1931
		Year 1931 46.0	Year 1931 52.6

Source: <sup>a</sup>/ Monthly Labor Review, December, 1931.

<sup>b</sup>/ "Wages and Hours of Labor in Foundries and Machine Shops in 1931," Bureau of Labor Statistics.

<sup>a</sup>/ "Wages in the United States," National Industrial Conference Board.

Obviously the unskilled labor rates for all foundries, as compiled by the National Industrial Conference Board, were 5 to 7 cents too high to fairly represent the common labor rate for gray iron foundries. However, the average hourly rates for male laborers, as compiled in the Bureau

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of Labor Statistics study for all foundries appeared to be fairly representative of gray iron foundries in the year 1931. Corresponding average hourly wage rates for earlier years follow:

Average Earnings per Hour in All Foundries

Year	Male Laborers	Female Laborers
1923	42.8 cents	31.6 cents
1925	46.1	36.2
1927	49.1	--
1929	49.0	36.6
1931	46.0	37.7

It is important to know the wage rates in gray iron foundries, but it is also desirable to know the number or percentage of wage earners included in the common labor wage group. This is shown in the attached table. Common laborers constituted only 16.0 per cent of the total number of wage earners, while molders, core makers, and pattern makers together accounted for over 60 per cent of the total.

## Average Hourly Wage Rates by Occupation - October 1931 g/

Occupation	Number of workers	Per cent of total	Hourly wage rate
<b>Holders:</b>			
Bench	560		.762
Floor	811		.633
Loam	22		.661
Machine	600		.642
Helpers	250		.483
Apprentices	106		.542
Foremen	89		1.000
<b>Total</b>	<b>2,453</b>	<b>43.5%</b>	
<b>Core makers:</b>			
Men	493		.692
Women	19		.421
Machine Men	9		.552
Machine Women	--		--
Helpers	62		.426
Apprentices	66		.512
Foremen	50		.867
<b>Total</b>	<b>719</b>	<b>12.7%</b>	
<b>Pattern makers:</b>			
Wood	118		.752
Metal	63		.697
Apprentices	25		.437
Foremen	24		.779
<b>Total</b>	<b>230</b>	<b>4.0%</b>	
<b>Chippers</b>			
Crane operators	313	5.5	.511
Copula tenders	88	1.6	.599
Flask makers	202	3.5	.569
Grinders, rough	82	1.4	.612
Inspectors, castings	230	4.0	.474
LABORERS, COMMON	119	2.1	.457
Maintenance men	906	16.0	.457
Pourers	145	2.5	.593
Sand blasters	27	.4	.464
<b>Total</b>	<b>91</b>	<b>1.6</b>	<b>.500</b>
<b>Welders:</b>			
Acetylene	12	.2	.676
Electric	4	.1	.657
Combination	1	.1	.652
<b>Grand Total</b>	<b>5,629</b>	<b>100.0%</b>	

g/ 115 foundries having 5,629 employees October 1931.

Source: Monthly Labor Review of Bureau of Labor Statistics, Dec. 1931, p. 197. (data from wage reports of Gray Iron Institute for October 1931).

#### Entrance Rates for Common Labor

The accompanying table shows the entrance rates for common labor in foundries and machine shops as reported by the Bureau of Labor Statistics once each year. Since all kinds of foundries as well as machine shops are included in the averages, these may not be closely comparable with the average entrance rates in gray iron foundries. But the high and low extremes are given for each of nine districts and for the country as a whole, and therefore the entrance rates for common labor in gray iron foundries would come within these upper and lower limits.

Another distinct contribution of this table is the evidence that regional differentials have existed in this industry for a long period of years, and are not created by the code.

During the eight years shown in the table the highest average entrance rates were always paid in the Pacific District, and the lowest average rates were paid in either the South Atlantic, the East South Central, or the West South Central District. These last three districts include all of the states which come within the Southern District as defined in the Gray Iron Foundry Industry Code (as revised for a public hearing).

FOUNDRY AND MACHINE WORK

HOURLY ENTRANCE WAGE RATES FOR COMMON LABOR BY DISTRICTS  
(cents)

	United States	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
Oct. 1, 1926										
Low	17.5	33.0	30.0	34.0	35.0	17.5	25.0	20.0	35.0	44.0
High	56.0	52.5	50.0	55.0	45.0	45.0	40.0	30.0	44.4	56.0
Average	35.9	40.5	40.6	42.7	39.7	28.4	29.9	25.2	38.1	50.1
July 1, 1927										
Low	17.5	33.0	30.0	34.0	35.0	17.5	26.0	22.5	35.0	44.0
High	56.0	45.0	50.0	50.0	50.0	43.8	40.0	30.0	41.8	56.0
Average	37.6	39.7	40.4	39.2	40.3	27.3	30.5	26.3	36.3	50.6
July 1, 1928										
Low	20.0	33.0	30.0	35.0	33.0	20.0	22.5	22.5	40.0	44.0
High	55.0	45.0	51.0	55.0	50.0	43.8	37.5	31.3	40.0	55.0
Average	36.4	39.0	40.4	42.2	39.4	27.8	31.0	28.4	40.0	51.1
July 1, 1929										
Low	17.5	33.0	30.0	35.0	33.0	17.5	27.5	20.0	30.0	44.0
High	56.0	50.0	55.0	55.0	50.0	43.8	40.0	31.3	46.0	56.0
Average	39.8	39.6	42.0	43.5	40.3	27.5	32.6	29.5	40.5	51.4
July 1, 1930										
Low	17.5	33.0	30.0	35.0	33.0	17.5	27.5	22.5	40.0	50.0
High	56.0	50.0	51.0	50.0	50.0	43.8	40.0	30.0	50.0	56.0
Average	39.0	40.2	41.0	43.0	41.1	27.7	33.4	25.9	42.3	52.0
July 1, 1931										
Low	17.0	30.0	30.0	30.0	34.0	17.0	27.5	22.5	40.0	45.0
High	56.3	45.0	51.0	55.0	45.0	43.8	40.0	30.0	45.0	56.3
Average	38.2	37.6	41.3	40.7	40.7	27.7	31.8	25.5	43.1	50.4

HOURLY ENTRANCE WAGE RATES FOR COMMON LABOR BY DISTRICTS (cont.)  
(cents)

	United States	New Eng- land	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
July 1, 1932										
Low	15.0	20.0	17.9	16.0	25.0	15.0	15.0	17.5	35.0	32.0
High	55.0	50.0	54.0	55.0	50.0	50.0	35.0	36.0	55.0	50.0
Average	34.8	36.1	36.9	35.3	35.4	25.0	23.0	25.5	43.0	43.9
July 1, 1933										
Low	12.5	25.0	17.0	16.0	20.0	15.0	12.5	15.0	25.0	32.0
High	53.0	53.0	51.0	45.0	45.0	40.0	35.0	40.0	40.0	50.0
Average	31.8	35.3	33.8	31.0	34.4	22.2	19.0	24.2	36.2	41.5

Source: Monthly Labor Review, Bureau of Labor Statistics.

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For the United States as a whole the average entrance rate per hour for common labor in foundry and machine shops was 31.8 cents on July 1, 1933. This compares with a weighted average of minimum hourly common labor rates of 30.1 cents during the first quarter of 1933. (An unweighted average of the minimum rates in 241 foundries, according to the Penton Publishing Company Survey would be over 32 cents during this same period.)

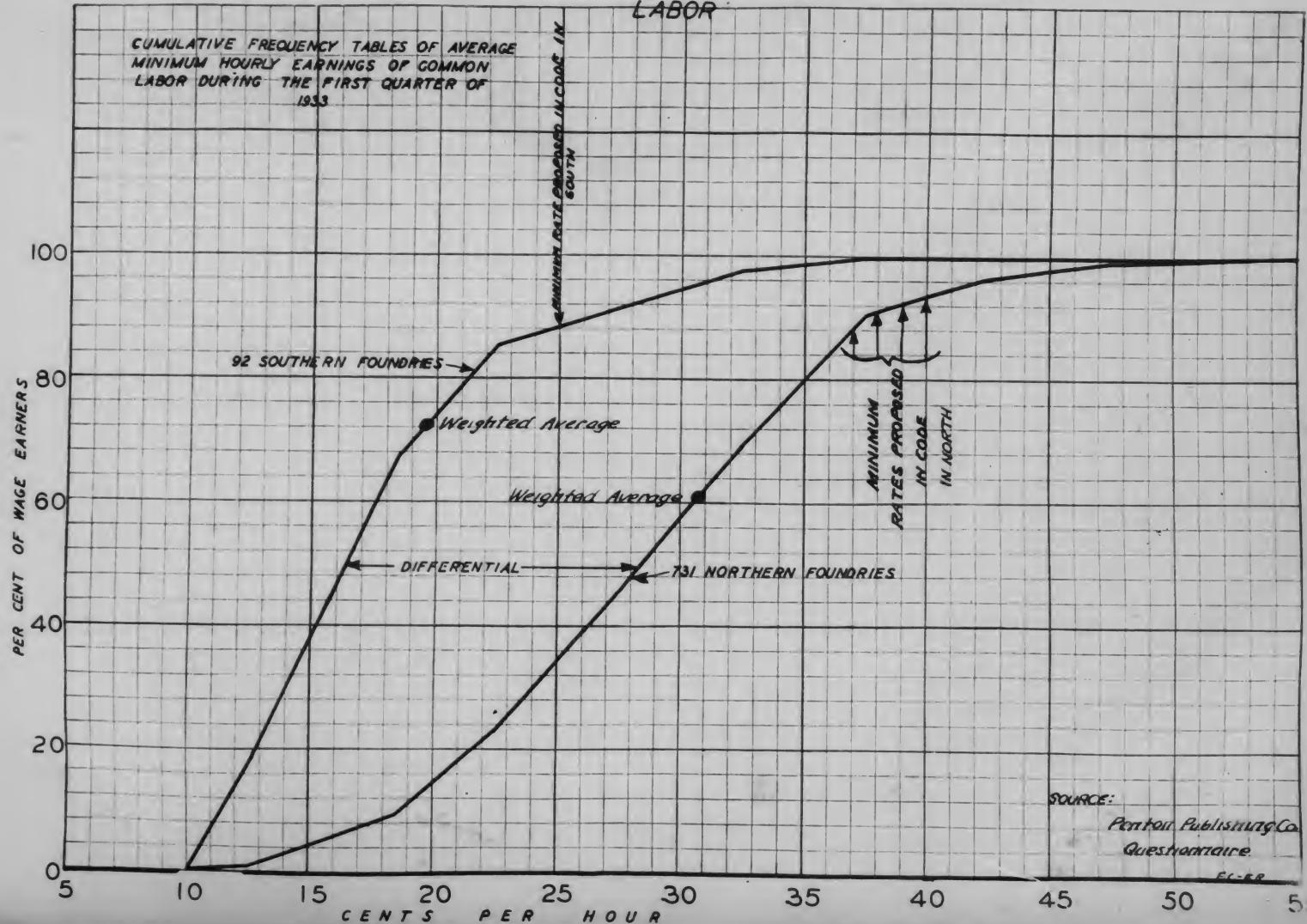
#### Minimum Rates by Districts

The minimum wage rates per hour for common labor have been estimated for the first quarter of 1933 by the representatives of the industry for both the Northern and Southern Districts. The estimates were based on 823 replies to a questionnaire made by the Penton Publishing Company. Of these 823 plants, 92 were in the Southern District and 731 in the Northern District.

The weighted average rate per hour was obtained by multiplying the middle rate of each class interval of five cents by the number employed in that class interval. The products were the totals of the wages paid per hour in each respective class interval. The aggregate of the hourly wages paid was then divided by the aggregate number employed in order to get the weighted average wage rate per hour.



GRAY IRON FOUNDRY INDUSTRY  
AVERAGE MINIMUM HOURLY EARNINGS OF COMMON  
LABOR



These computations gave weighted average minimum rates of 30.7 cents per hour for common labor in the Northern District, and 19.5 cents in the Southern District during the first quarter of 1933 (see chart). A summary of the above computations follows:

First quarter 1933				
Minimum Common Labor Rate per Hour				
	Plants	Employees	Total hourly wages	Weighted average wage rates per hour
North	731	22,627	\$6,956.00	30.7 cents
South	92	1,367	266.47	19.5
United States	823	23,994	7,222.47	30.1

The average entrance rate for common labor in foundry and machine shops on July 1, 1933 in the three southern districts as grouped by the Bureau of Labor Statistics were as follows:

July 1, 1933  
Average  
(Cents per hour)

South Atlantic - - - - - 22.2

East South Central - - - - 19.0

West South Central - - - - 24.2

Average of Southern Group 21.8

The average entrance rate in the southern districts

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was therefore 21.8 cents per hour as of July 1, 1933. This compares with a weighted average minimum hourly wage for common labor, as estimated for the first quarter of 1933, of 19.5 cents per hour in the Southern District, and with a proposed minimum wage rate of 25 cents per hour in the Southern District. A comparison follows:

Average Common Labor Wage Rates per  
Hour, Southern District

Average Minimum - First Quarter, 1933 . . . . .	19.5 cents
Entrance Rates (Foundry and Machine Shops)	
July 1, 1933 . . . . .	21.8 *
Proposed Minimum Rate in Code . . . . .	25.0 *

The conclusion to be drawn from the above table is that the Southern District wage rate of 25 cents per hour as proposed in the code is higher than the minimum rates of pay to common labor under pre-code conditions.

The average entrance rate for common labor in foundry and machine shops on July 1, 1933 in the six Northern Districts, as classified by the Bureau of Labor Statistics, were as follows:

July 1, 1933  
Average cents  
per Hour

New England	35.3
Middle Atlantic	33.8
East North Central	31.0
West North Central	34.4
Mountain	36.2
Pacific	41.5

Average of Northern  
Group

35.4

The average of entrance rates in the Northern Districts was therefore 35.4 cents per hour as of July 1, 1933. This compares with a weighted average minimum hourly wage for common labor, as estimated for the first quarter of 1933, of 30.7 cents, and with proposed minimum wage rates in the code of 37, 38, 39, or 40 cents per hour depending on the population of the city in which the wage is paid. A comparison follows:

**Average Common Labor Wage Rates per Hour, Northern District**

Average Minimum - First Quarter, 1933 . . . . . 30.7 cents

#### Entrance Gates (Foundry and Machine Shop)

July 1, 1933 . . . . . 35.4

**Proposed Minimum Rates in Code in Cities of:**

Less than 25,000 population	•	•	37.0	•
25,000 to 250,000	•	•	36.0	•
250,000 to 500,000	•	•	39.0	•
500,000 and over	•	•	40.0	•

The conclusion to be drawn from the above table is that the Northern District wage rates of 37 to 40 cents per hour as proposed in the code are higher than were the minimum rates of pay to common labor under pre-code conditions.

### Effect of High Rate Increases on Purchasing Power

The increase in payrolls, as estimated by the representatives of the industry, is 25%. This may be inaccurate as they will readily admit. It is based on the assumption that common labor equals 2% of all employees. But in Chapter III the proportion of common labor was shown to be

a little over 16% of shop employees.

It is not possible to estimate the total payrolls within reasonably accurate limits, for it is not possible to estimate the number of employees very closely, and the average wages per worker are not available. An increase of 25% in the purchasing power of common labor in the South, and of about 20% in the North seems to be indicated. But if common labor accounts for only 16% of shop workers, the indicated increase in the purchasing power of gray iron foundry wage earners would probably be less than 5% as a result of the code.

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## CHAPTER IV

### SELLING PRICES AND RAW MATERIAL COSTS

Gray iron castings are made in a wide variety of patterns, and differ considerably in weights. The lack of homogeneity as between units makes price comparisons practically impossible. The average price per ton of gray iron castings has been computed from the Census figures which in 1931 included over 1,800 gray iron foundries which did chiefly a jobbing business.

#### GRAY IRON CASTINGS

	Value (\$1,000,000)	Tons (1,000 short tons)	Price per ton (dollars)
1925	324.7	4,405.8	74
1927	340.3	5,110.0	67
1929	375.5	5,079.8	71
1931	174.2	2,390.5	73

a/ Partly estimated.

The principal raw materials used are scrap and pig iron. Pig iron prices have advanced over 20 per cent from the low of the year and, steel scrap prices have doubled.

## CHAPTER V

## PART A. - DETERMINATION OF MAXIMUM HOURS

The proposed maximum number of hours of work in the gray iron foundry industry is 40 hours per week, except for peak periods when 48 hours is the number permitted. Only 64 hours of overtime are permitted to be worked during any six-month period. No one can work beyond these periods unless he is paid time and one-third. The number of hours a day is unlimited, however, because of the problem of having to wait to run a heat until the mixture in the furnace is ready.

Several industries whose products are competitive, and industries which compete for labor, have in many cases provided for a 40-hour week in their codes. The gray iron foundry industry must compete with these industries for labor, and workers will tend to go to the industry which permits them to earn the larger weekly wage, even though the hourly rate be the same. For this reason and also because of the peculiarities of the industry, a 40-hour week seems advisable. The 40-hour week proposed in the code would cause an increase in employment in most of the 52 Southern plants covered by the Southern Foundries' questionnaire as shown on the chart in Chapter II.

A breakdown of the Fenton Publishing Company's questionnaire showed that in early 1933 there was a larger percentage of plants working over 40 hours in the South than in the

North. Therefore, the increase in employment at 40 hours per week would probably not be as large proportionately in the North as in the South.

But the South would probably be seriously handicapped if it had to reduce hours below 40. As shown in the chart in Chapter II, over 70 per cent of the wage earners in the South were working more than 40 hours per week in July 1933. It may be advisable, therefore, to allow 40 hours as the maximum work week, even though the industry is now operating at a low rate of capacity.

In Chapter II it was estimated that a forty-hour week in July 1933 would have caused the reabsorption of 5,350 employees.

#### PART B. - DETERMINATION OF A MINIMUM WAGE

The minimum wages that are set by the code in the Northern District are 37, 38, 39, and 40 cents per hour, depending on the population of the city in which the foundry is located. These rates compare with 35 to 40 cents in the competitive Steel Casting Industry and the Iron and Steel Industry, which have equal rates. The gray iron foundry rates are lower, however, than those in the competitive Malleable Iron Industry which proposed a flat 40-cent rate per hour throughout the North.

An analysis of the chart presented in Chapter III showing minimum wages by districts, indicates that if those

proposed code minimums were put into effect in the North during the first quarter of 1933, about 33 per cent of all workers would have had their purchasing power increased.

The minimum wage proposed in the South is 25 cents per hour. This is identical with the rates paid in the Southern Districts of two competitive industries, namely, the Iron and Steel Industry and the Steel Casting Industry. There is one exception in these approved codes, however, for both of these industries pay 27 cents per hour in Birmingham. It might not be fair to them as competitors to have to pay 2 cents more per hour. Furthermore, higher wages are proposed for cities than for small towns in the North; then why not in the South?

The Southern differential has existed for years, as is shown by the table of entrance rates for common labor in Chapter III. The double frequency chart in Chapter III shows clearly that the differential in the first quarter of 1933 was  $(30.7d - 19.5d)$  11.2 cents. The entrance rates for common labor show that on July 1, 1933 the differential for foundries and machine shops was  $(35.4d - 21.8d)$  13.6 cents per hour between the Northern and Southern Districts. Therefore, the code does not introduce any radical change in the differential which it proposes of from 12 to 15 cents.

Again turning to the double frequency chart in Chapter III, which compares the Southern and Northern minimums, we find that the proposed 25 cent rate would have increased

the purchasing power of 85 per cent of the workers if applied in the first quarter of 1933.

Considering competition, the wage rates proposed in the code seem to be fair, with the exception of Birmingham. It might be advisable to pay 27 cents in this district in order to preserve fair competition.

#### PART C. - RECOMMENDATIONS ON SELLING BELOW COST

We question the advisability of including Article VII, Section I (1) on selling industry products below cost.

The Steel Casting Industry Code (Approved) does not prohibit manufacturers from selling below cost. It is highly important to note that this industry is a keen competitor and it can readily take away business from the Gray Iron Foundry Industry if the latter has its price structure "frozen".

No provision is made for sales of distress merchandise, goods that have gone out of style, new lines opened at a high advertising cost, or inventories which can be replaced at lower costs due to falling raw material prices, etc.

However, if the industry insists upon a selling-below-cost provision, the following should be observed:

- (a) Individual costs ought to be used, and not "average", "representative", "fair" or "reasonable" costs.
- (b) Any individual may offer goods below his own cost to meet the price or quotation of a lower cost competitor.

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- (c) It may be desirable to permit an individual to meet competition in violation of the selling-below-cost provision concerning which he has made complaint to the Code Authority or the body whose function it is to receive such complaints, or any authorized agency thereof, but only pending action on such complaints. (Adapted from Article V, Rule 4, of the Petroleum Industry Code.)
- (d) The cost formula should recognize that interest, selling and advertising expenses and return on investment are not allowable items of cost.
- (e) The cost formula should recognize that burden should be allocated on the basis of a normal level of operations, for instance the average operations during 1927-1932, with adjustments in case the capacity of plants has been changed since the depression started.

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